

**ABSTRACT**

Methods, and models therefrom, to construct a 3-D polygonal model of a 3-D irregular volume within a GIS platform that include introducing data relating to the volume; estimating at least one 2-D polygon representing the volume's lateral boundary, estimating irregular surfaces representing the volume's top and bottom; clipping the estimated surfaces with the estimated 2-D polygon; constructing multipatches of a network of triangular panels or a grid of regularly spaced polylineZs; and joining the attributes to the model.